Vol. 90. Part 16. Pp. 455-466, 7 figs. 15th November, 1940.

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PUBLISHED BY THE SOCIETY AND
SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W.7

Price 4s. 0d.

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CERATOPOGONIDAE (DIPTERA, NEMATOCERA) FROM SOUTHERN AFRICA

By Botha de Meillon, D.Sc.

(*The South African Institute for Medical Research, Johannesburg, South Africa.*)

Manuscript received 15th January, 1940.

(Read 5th June, 1940.)

With Seven Text-figures.

The types of the species described below have been placed in the collection of the South African Institute for Medical Research at Johannesburg.

Bezzia agathae sp. n.

Female.

General appearance. A large dark brown species with ornamented legs.

Head. Vertex greyish; clypeus and proboscis dark brown.

Eyes. Widely separated above, bare.

Palps. Brown; III not swollen, no definite sensory pit; the relative lengths of the segments are: III 20, IV 10, V 9.

Antennae. The relative lengths and greatest widths of the segments are:—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	22	10	10	10	10	12	11	12	25	29	26	24	25
Width . .	8	7	7	7	6	6	6	6	6	6	6	6	5

Thorax. Mesonotum with a prominent frontal tubercle; dark brown with greyish reflections, viewed from the front there is a dark brown median band; pleurae greyish; scutellum dark brown; halteres greyish.

Wing.

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·84	—	1·0	2·6	2·0	1·5	0·8	0·94	1·8	—

Wing field clear without any ornamentation; microtrichia very coarse and obvious at low magnifications; alula apparently bare.

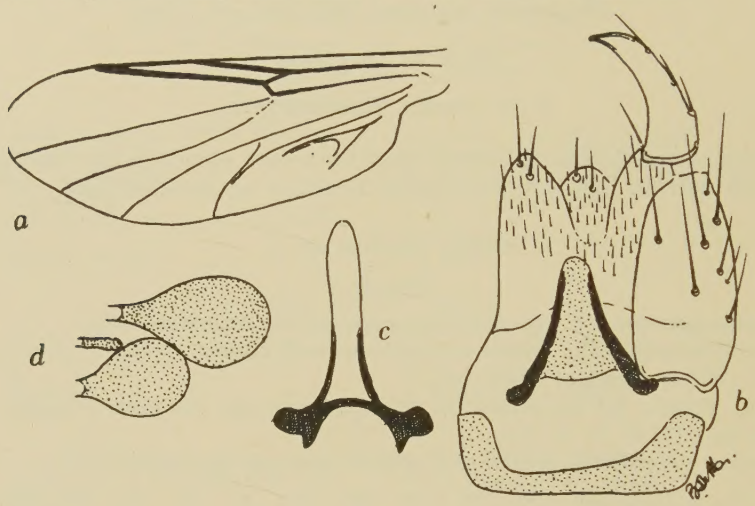
Legs.

	F	T	i	ii	iii	iv	v
Fore leg . . .	33	29	14	8	4	4	7
Mid leg . . .	40	34	22	10	5	4	7
Hind leg . . .	50	47	29	12	5	4	7

Coxae dark brown; fore femur with a single black spine ventrally, other femora unarmed; leg segments yellowish with conspicuous dark markings as follows: all femora with a

subapical dark band and their apices darkened; all tibiae narrowly darkened apically and basally and with a median dark band; tarsi infuscated apically but most of V darkened; claws simple, about half as long as V, one talon on the mid leg of one specimen showed a small basal tooth.

Abdomen. Dark brown; *spermathecae* (fig. 1, d) three in number, two, large, pyriform, measuring, exclusive of the ducts, 52 × 48 μ and 40 × 40 μ, each of these with wide pigmented ducts: in the case of the larger 24 μ long and 16 μ long in the smaller; the third spermatheca is minute, tubular, 20 μ long, and of an even width of about 1 μ; two gland rods are present arising from sternite VII and ending in segment III.



1

FIG. 1.—*Bezzia agathae* sp. n.; a, male wing (fringe not shown); b, terminalia; c, parameres; d, spermathecae.

Male.

General appearance. As in the female but smaller and legs less strikingly banded.

Head. As in the female.

Eyes. Separated above, bare.

Palps. Segment III not swollen, apparently without a sensory pit.

Antennae. The relative lengths and greatest widths of the segments are :—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	25	11	10	10	10	10	9	9	15	18	24	27	25
Width . .	11	8	7	7	6	6	6	7	6	6	6	6	6

Thorax. As in the female but darker, with a prominent frontal tubercle.

Wing (fig. 1, a).

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·54	—	0·58	1·25	1·01	0·8	0·5	0·6	1·04	—

Legs. The relative lengths of the leg segments are :—

	F	T	i	ii	iii	iv	v
Fore leg . . .	25	22	10	6	4	3	5
Mid leg . . .	32	26	15	8	4	3	5
Hind leg . . .	35	30	22	9	4	3	5

Femora and tibiae largely dark without the conspicuous banding seen in the female; tarsi pale but V on all legs infuscated; fore femora armed with a single spine as in the female but in one specimen this spine was absent.

Abdomen. As in the female. *Terminalia* (fig. 1, b and c) IXt deeply excavated; claspers slightly shorter than the side pieces; aedeagus and parameres of the type commonly seen in *Bezzia* and *Palpomyia*.

A series hatched from pupae collected in a dam, TRANSVAAL : New Agatha, Tzaneen, viii.1939.

This species possesses two characters usually regarded as typical of the genus *Palpomyia*, namely a prominent frontal tubercle on the mesonotum in both sexes and glands rod in the female. It is closely related to *B. africana* Ing. & Macfie but separable by the fact that the fore femur has only one spine or may be unarmed.

Bezzia umlalazia sp. n.

Male.

General appearance. A small dark brown midge without any distinctive markings.

Head. Vertex dark brown; mouth-parts and proboscis dark brown.

Eyes. Widely separated, bare.

Palps. Segment III not swollen and without a marked sensory pit.

Antennae. The relative lengths and greatest widths of the segments are :—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	22	10	9	9	9	9	9	8	11	16	18	18	20
Width . .	10	8	7	7	7	6	6	6	6	6	6	6	6

Tori and flagellar segments very dark brown.

Thorax. Mesonotum with a minute frontal spine, dark brown; pleurae very dark brown; scutellum a shade paler than the mesonotum; halteres brown throughout.

Wing (fig. 2, a).

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·54	—	—	1·3	1·0	0·7	0·5	0·6	1·0	—

Unornamented, not infuscated below the costa, alula and squama bare.

Legs. The relative lengths of the leg segments are :—

	F	T	i	ii	iii	iv	v
Fore leg . . .	22	18	10	6	5	3	5
Mid leg . . .	29	24	12	8	5	3	5
Hind leg . . .	32	30	19	8	5	4	5

Slightly paler than the thorax and abdomen, very faintly banded; femora with a faint subapical dark band; tibiae with a faint dark band just before the middle; fore femur with a single spine, other femora unarmed; tIV not cordiform; claws simple, small, equal.

Abdomen. Very dark brown shiny. *Terminalia* (fig. 2, b and c) tIX not excavated; claspers well developed, about as long as the side pieces; aedeagus and parameres of the shape commonly seen in this genus and *Palpomyia*.

4 ♂♂ hatched from pupae collected in seepage pools, ZULULAND: Eshowe, 27.xi.1937.

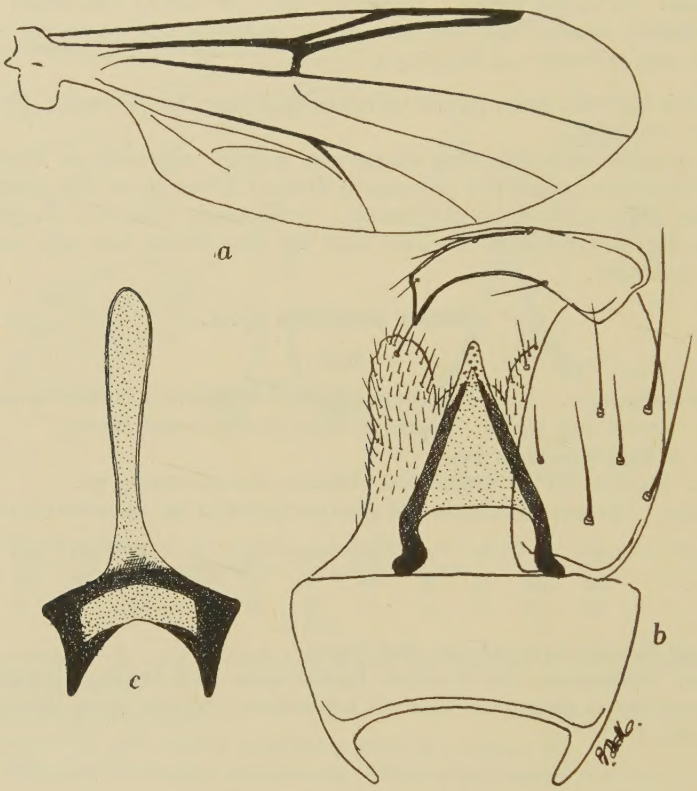


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FIG. 2.—*Bezzia umlalazia* sp. n.; a, male wing (fringe not shown); b, terminalia; c, parameres.

This insect may be the male of *B. foyi* Ing. & Macfie; it is also like *B. dewulfi* Goetgh. but the mesonotum is not shiny black. It is, however, most nearly related to *B. edwardsi* De Meill., a species from Northern Rhodesia. Externally these two species are inseparable and only differ in microscopic details. In *edwardsi* the parameres are much shorter and the aedeagus is not so pointed; the new species also has only a single spine on the fore femur and none on the posterior legs. In *edwardsi* the antennal segments XII–XV are four or more times as long as broad whereas in the new species they are only about three times as long as broad.

Dicrobezzia belliger sp. n.

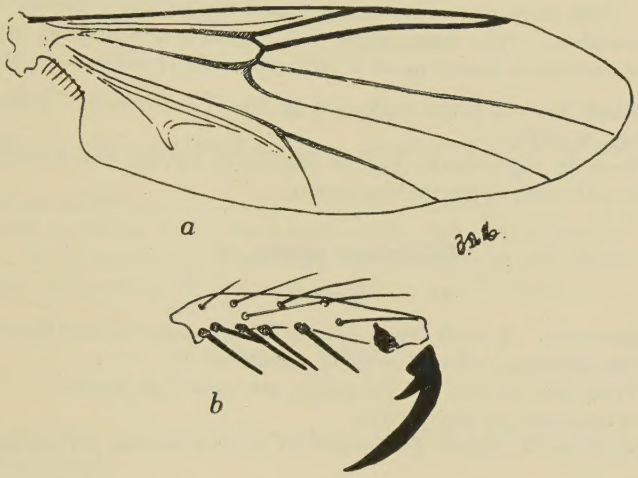
Female.

General appearance. A medium-sized species with dark, almost black, mesonotum and pleurae; legs and abdomen, especially the latter, much paler.

Head. Clypeus and frons almost black but greyish in some lights; mouth-parts dark brown.

Eyes. Very widely separated above, bare.

Palps. Very dark brown; III not swollen, without a sensory pit; the relative lengths of the segments are: II 13, III 15, IV 8, V 9.



3

FIG. 3.—*Dicrobezzia belliger* sp. n.; a, female wing (fringe not shown); b, tarsus V of the hind leg.

Antennae. The relative lengths and greatest widths of the segments are:—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	18	8	8	8	9	9	9	10	21	22	22	20	24
Width . .	13	7	6	6	5	5	5	5	6	5	5	5	5

Tori and flagellar segments black or very dark brown.

Thorax. Mesonotum black but with greyish reflections in some lights; pleurae as in mesonotum; scutellum yellowish; postnotum as in mesonotum; halteres creamy especially the crowns.

Wing (fig. 3, a).

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·7	—	0·8	2·0	1·6	1·0	0·7	0·8	1·4	—

The wing membrane is clear with no infuscations; base of M2 weak; alula fringed; squama bare.

Legs (fig. 3, b). The relative lengths of the leg segments are :—

	F	T	i	ii	iii	iv	v
Fore leg . . .	35	35	15	8	6	4	9
Mid leg . . .	41	33	19	9	5	3	8
Hind leg . . .	45	40	28	10	7	4	8

Femora and tibiae dark brown; tarsi I–IV straw coloured, tV very dark brown, apices of tarsal segments slightly infuscated; claws long, bifid, the longer talon more than half the length of tV; femora unarmed; tV of all legs with black, blunt-tipped spines.

Abdomen. Pale straw coloured throughout and contrasting markedly with the dark thorax. *Spermatheca.* Two, large, ducts not pigmented, measuring 84 × 68 μ and 68 × 56 μ and one minute measuring 24 × 20 μ with a small portion of the duct pigmented.

1 ♀ hatched from a pupa collected in the TRANSVAAL : Yokeskei River, Johannesburg, v.1939.

Differs from *D. nigritibialis* Ing. & Macfie in having the scutellum yellow, the abdomen pale and three spermathecae.

Stilobezzia luteola sp. n.

Female.

General appearance. A small insect with the head, mesonotum and tip of the abdomen dark, rest of the abdomen yellowish or straw coloured.

Head. Vertex dark brown; clypeus and mouth-parts dark brown.

Eyes. Widely separated above, bare.

Palps. Segments II, III and V subequal, IV slightly shorter, III not swollen without a sensory pit.

Antennae. The relative lengths and greatest widths of the segments are :—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	11	8	7	7	7	7	8	9	10	10	9	8	13
Width . .	5	4	4	4	4	4	4	4	4	4	4	4	4

Tori brown, flagellar segments straw coloured.

Thorax. Mesonotum brown; scutellum yellowish with two central and a lateral bristle on each side; pleurae brown; halteres yellow; postnotum black.

Wing (fig. 4, a).

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·4	0·08	0·32	1·0	0·84	0·54	0·4	0·4	0·74	0·46

Unornamented with a few macrotrichia at the extreme apex of the wing; radius basally with macrotrichia; alula fringed; squama bare.

Legs. Coxae brown, rest of the segments lighter; hind tibia with a long apical barbed spine; tI and tII of the hind leg with the usual bulbous hairs; a short spine at the apex of tI, tII and tIII of the hind leg; in the mid leg tI with a spine at the base

and an additional one at the apex; tIV cordiform; claws on the four posterior legs large and unequal and on the fore legs small and nearly subequal.

Abdomen. Bright yellow except apically where very dark brown; cerci yellowish.
Spermatheca. Two, large, pyriform highly pigmented measuring 60 × 48 μ, a large portion, approximately 24 μ, of the duct of each pigmented.

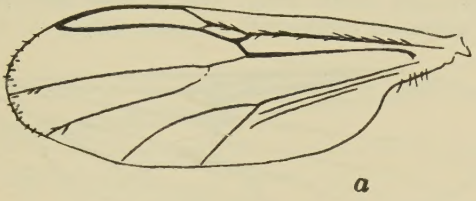


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FIG. 4.—*Stilobezzia luteola* sp. n.; a, female wing (fringe not shown).

3 ♀♀ taken at light, ZULULAND : Eshowe, 7.i.1938.

This insect is related to *S. tetragona* Goetgh. but the first radial cell is longer than broad. It differs from *S. lanceolata* Macfie, of which only the male is known, in being more yellowish; the present species is also darker.

Palpomyia errinae sp. n.

Male.

General appearance. A shiny black species without any ornamentation.
Head. Shiny black.
Eyes. Very widely separated above, bare.
Palps. Very dark brown; III not swollen without a sensory pit; the relative lengths of the segments are : II 13, III 15, IV 8, V 9.
Antennae. The relative lengths and greatest widths of the segments are :—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	—	10	12	12	12	12	12	13	13	19	23	25	35
Width . .	—	10	9	8	7	7	7	7	7	6	7	6	7

Tori and flagellar segments shiny black.
Thorax. Mesonotum shiny black without any bristles or hairs; scutellum, postnotum and pleurae shiny black or very dark brown; halteres completely infuscated.
Wing (fig. 5, a).

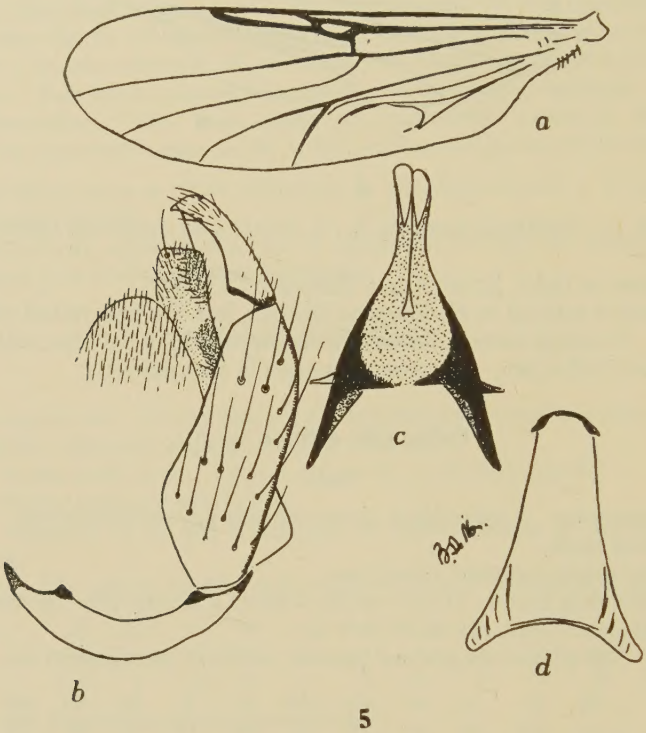
Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·56	0·12	0·32	1·7	1·16	0·88	0·66	0·76	1·3	—

The wing membrane is clear with no infuscations; base of M2 weak : alula fringed; squama with one or two hairs.

Legs. The relative lengths of the leg segments are :—

	F	T	i	ii	iii	iv	v
Fore leg . . .	31	29	12	6	5	4	6
Mid leg . . .	40	32	16	9	5	4	6
Hind leg . . .	42	35	19	10	6	4	7

Femora and tibiae very dark brown, shiny; tarsi a shade paler, specially on the four anterior legs; femora unarmed; claws small, subequal, simple.



5

Fig. 5.—*Palpomyia errinae* sp. n.; a, male wing (fringe not shown); b, terminalia; c, parameres; d, aedeagus.

Abdomen. Very dark brown almost black, shiny. *Terminalia* (fig. 5, b, c, d) IXst deeply excavated; tergite with a pair of prominent lateral apical lobes; side pieces well developed; claspers about half the length of the side pieces; aedeagus triangular in shape, broad at the apex; parameres fused basally, separated apically with prominent basal arms.

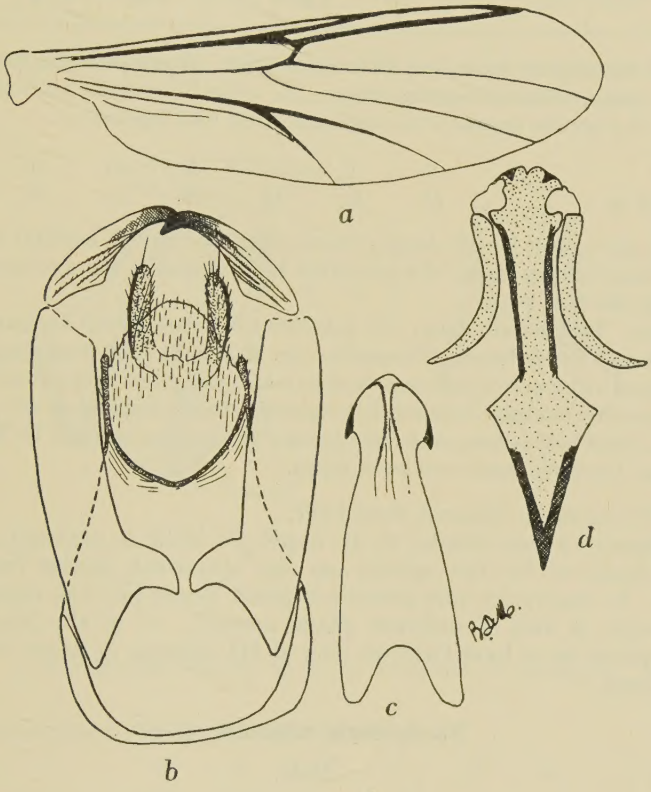
1 ♂ hatched from a pupa collected in the Transvaal: Yokeskei River, Johannesburg, v.1939.

This species is related to *P. sanctae-luciae* De Meill., the terminalia of the two species being very much alike; specific differences, however, do occur. The side pieces are much longer in the present species, the parameres with longer basal arms; differences in antennal and palpal measurements are evident. Macroscopically these two species are easily separable by the presence of an infuscated spot just below the end of the costa in *sanctae-luciae*. There is a remarkable similarity between the terminalia of this species and those of *Probezzia stephensi* Ing. & Macfie.

Macroptilum fluviatilis sp. n.

Male.

General appearance. A brown species without any ornamentation.
Head. Vertex very dark brown, shiny; mouth-parts and proboscis brown.
Eyes. Bare, widely separated above.
Palps. Small, III not swollen and without a sensory pit.



6

FIG. 6.—*Macroptilum fluviatilis* sp. n.; a, male wing (fringe not shown); b, terminalia; c, aedeagus; d, parameres.

Antennae. The relative lengths and greatest widths of the segments are :—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	32	16	16	17	17	17	17	17	18	29	27	29	36
Width . .	8	6	6	6	6	6	6	6	7	6	6	7	7

Tori dark brown; flagellar segments brown; panache absent.

Thorax. Mesonotum pointed in front, brown not shiny; pleurae brown; scutellum pale brown, almost yellowish, with three central bristles and a lateral marginal one on each side; halteres brown with slightly infuscate crowns.

Wing (fig. 6, a).

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·58	—	—	1·9	1·6	1·1	0·84	0·74	1·4	—

Unadorned but slightly infuscated below the costa; no macrotrichia, but microtrichia dense and coarse; alula and squama bare.

Legs. The relative lengths of the segments of the hind legs are :—

	F	T	i	ii	iii	iv	v
Hind leg . . .	47	44	42	19	8	3	4

Pale brown throughout but tV slightly darker; unarmed but tII and tIII of the hind leg with the usual bulbous hairs; tIV somewhat heart-shaped in the four anterior legs but elongated in the hind legs.

Abdomen. Dark brown, shiny; tIX pale brown or yellowish and so contrasting sharply with the rest of the abdomen. *Terminalia* (fig. 6, b, c, d) stIX deeply excavated; tIX well developed with a pair of prominent median lobes; side pieces with an internal expansion basally, thereafter of almost even width throughout, slightly longer than tIX; claspers well developed, about half as long as the side pieces; aedeagus as in *bayeri* De Meill. but apex pointed, not truncate; parameres as in *bayeri.*

1 ♂, Zululand : Eshowe, 8.xii.1937.

This species is very similar to *M. bayeri* De Meill. in external appearances. The terminalia of the two species are also somewhat similar but differences do exist. In *bayeri* the side pieces are much longer and the claspers shorter, the aedeagus is also of different shape apically; tI of the hind leg in the present species is at least twice as long as tII whereas in *bayeri* it is less than twice as long.

Forcipomyia waldenia sp. n.

Male.

General appearance. A small species with pale legs and pleurae and black mesonotum and scutellum; hind femur conspicuously banded, legs with scales.

Head. Vertex very dark brown.

Eyes. Bare, closely approximated above.

Palps. Dark brown; III swollen basally with a prominent sensory pit, longer than IV + V.

Antennae. The relative lengths and greatest widths of the segments are :—

	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
Length . .	12	12	11	10	10	12	13	13	13	43	29	21	25
Width . .	12	12	11	11	10	10	10	8	8	8	7	6	5

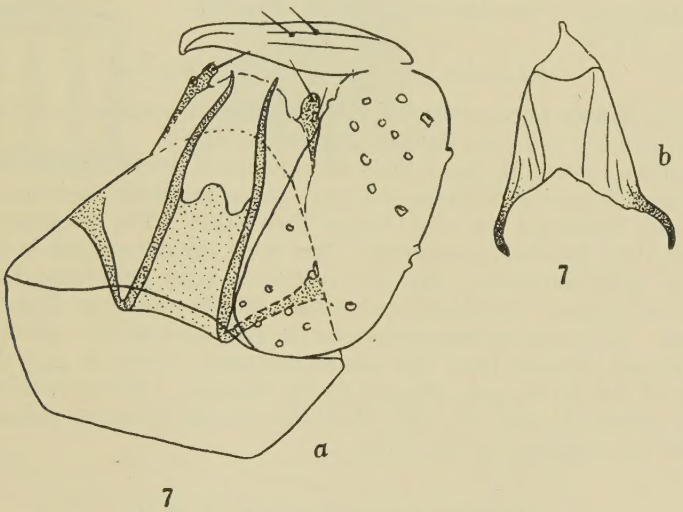
Tori dark brown, flagellar segments pale brown; verticils black basally, greyish apically.

Thorax. Mesonotum black not shiny; humeral calli white; pleurae largely pale; scutellum and postnotum black; halteres waxy white.

Wing.

Width. mm.	Internal measurements. mm.		Measured from the arculus. mm.						
	1st R. cell	2nd R. cell	Total length	End of costa	R.I	Base of cross-vein	fCu	Cu.I	fM
0·36	—	—	1·2	0·38	—	—	0·44	0·88	—

Unadorned but macrotrichia whitish near the end of the costa; one small radial cell only; costa ends before fCu; wing field densely and evenly clothed with macrotrichia.



7

Fig. 7.—*Forcipomyia waldenia* sp. n.; a, terminalia; b, aedeagus.

Legs. The relative lengths of the leg segments are :—

	F	T	i	ii	iii	iv	v
Fore leg . . .	22	22	7	9	5	3	3
Mid leg . . .	22	22	6	10	6	4	3
Hind leg . . .	30	30	7	10	7	5	3

Largely straw-coloured but with dark markings as follows: a small black spot on the coxae; a prominent dark submedian band on the hind femur.

Abdomen. Largely pale but with lateral dark spots. *Terminalia* (fig. 7a, b) IXst. not excavated or produced; side pieces and claspers normal; aedeagus of the usual scoop shape; parameres fused basally and connected to the side pieces by long apodemes; terminally the parameres are free and consist of a pair of thin strips of chitin.

1 ♂ Transvaal: New Agatha, King's Walden, Tzaneen, viii.1939.

The species is near *F. nigricoxis* Goetgh., but legs not dark, terminalia very like those of *F. hirsuta* Ing. & Macfie; legs, however, not marked as in that species and fCu beyond the end of the costa. The antennal measurements are also different in *hirsuta*, XII being longer than XIV and XV combined.

Forcipomyia ashantii Ingram & Macfie.

1924 *Forcipomyia ashantii* Ing. & Macfie, *Ann. trop. Med. Parasit.* **18** : 589 (Gold Coast; Nigeria).
1934 *Forcipomyia ashantii* Ing. & Macfie, *ibid.* **28** : 178 (Malaya).

Several males were taken on the bark of a camphor tree. The specimens were identical in all respects with the original description of Ingram and Macfie. The present record gives further evidence of the very wide distribution of these small midges.

♂♂, N. Transvaal : New Agatha, Tzaneen, viii.1939.

Forcipomyia inornatipennis (Aust.).

1 ♂ taken on a camphor tree in company with *F. ashantii* and *F. waldenia* described above.

N. Transvaal : New Agatha, Tzaneen, viii.1939.

Culicoides pycnostictus Ing. & Macfie.

♂♀ hatched from pupae collected in exposed river pools near Johannesburg, Transvaal, and 1 ♂ taken at light at Holfontein, O.F.S.

This species apparently has a wide distribution in South Africa, having been recorded from the northern Transvaal, as *C. alexis* De Meill., Zululand and now the southern Transvaal and the Orange Free State. The present specimens are darker than Zululand specimens. The wing ornamentation is apparently subject to some variation. Macfie [1] mentions very pale-winged specimens from Dar-es-Salaam. Zululand specimens are like the type described from Nyasaland. In Johannesburg specimens the pale spot at the end of the costa is separate and divided from the one immediately below it and there is no extension of this latter pale area on to the median. All specimens agree in the male terminalia and the fact that the female pharynx possesses some small teeth as described by the writer.

Culicoides inornatipennis C., I. & M.

Numerous females taken biting, S. Rhodesia : Salisbury, 9.ii.1939 (*A. Cuthbertson*); S. Rhodesia : Delano Estate, Que Que, 6.i.1939 (*D. O. Barnes*); S. Rhodesia : Wankie (*J. K. Chorley*); S. Rhodesia : Selenbani Camp, Shangani River, Bubi District (*J. K. Chorley*).

These midges agree with those that I have reported from the Congo [2] in having two central bristles on the scutellum and not one as reported by Carter, Ingram and Macfie.

Culicoides pallidipennis C., I. & M.

1 ♀ agreeing in all respects with this species taken as prey of *Coenosia humilis* Mcq., S. Rhodesia : Salisbury, 19.iii.1939 (*A. Cuthbertson*).

[1] Macfie, J. W. S., 1926, Ceratopogoninae from Dar-es-Salaam. *Bull. ent. Res.* **16** : 357.
[2] De Meillon, B., 1937, Studies on Insects of Medical Importance from Southern Africa and Adjacent Territories—IV. *Publ. S. Afr. Inst. med. Res.* **7** : 328.